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A METHOD FOR REDUCING ROOF MEMBRANE DAMAGE FROM HAIL/FASTENER CONTACT IMPACT AND A ROOF SYSTEM HAVING REDUCED MEMBRANE DAMAGE FROM HAIL/FASTENER IMPACT

BACKGROUND

[0001] In the roofing industry and particularly the commercial roofing industry, exposed roofing membranes have become prevalent. Single ply roofing systems, and others using an exposed membrane, although very effective are subject to greater damage from hail impact than some other types of roof systems. One significant exacerbator of the potential for damage from hail is the very fasteners that retain the membrane and roof assembly component materials underlying the membrane. Such fasteners are nails, special clips, anchors or screws and typically have washers positioned thereunder to spread the hold down load of the head of the fastener. Because fasteners are generally immovable, connected to structural subjacent roof support materials or otherwise substantially immoveable, they pose particular risks to the overlying waterproofing membrane when hail strikes. The fastener/washer act essentially as an anvil against which the roofing membrane can be suddenly and violently compressed by the substantial momentum transfer from a hail stone. This compression tends to rapidly and for short duration "flow" the membrane material in all directions from the impact site. Rupture of the overlying waterproofing membrane can easily occur when hail hits the membrane in an area of an underlying fastener. In order to improve the hail resistance of such roof structures, this characteristic must be alleviated. The roofing industry tests for hail presently utilize a ½" to 2" steel ball. The ball is accelerated to terminal (free full) velocity and directed at a roof assembly to measure hail impact. Recently, hail testing has been developed further to enable the shooting of actual ice balls from an air cannon through a timing device at a roof assembly which has been cooled to 38°F with chilled water. This test more realistically shows the effects of various size hail ice balls from ½" to 5" diameter at various mph speeds into a roof assembly sample. A 3" hail ball approximately the size of a baseball will fall in still air at 95 to 97 mph. If the 3" hail is caught in a down draft of wind it can increase its speed. Some 3" hail impact dents on sheet metal equipment on roofs hit by hail required a 3" hail ball to be shot at 150 mph to replicate the dent. At 100 mph, a 3" hail ball will go through ½ inch APA approved oriented strand board (osb) wafer board and at 135 mph and a 3" hail ball will go through ½" plywood.

SUMMARY

[0002] Disclosed herein is a method for reducing roof membrane damage from hail/fastener impact by locating a fastener, positioning an energy absorbing material over said fastener and affixing said material to said fastener.

[0003] Further disclosed herein is a roof system with reduced hail/fastener impact damage characteristics. The system comprises a roof substrate having one or more layers of material at least one fastener exposed at a top surface of said substrate and a dedicated energy absorbing material positioned over said at least one fastener. A roof water proofing membrane is placed atop the foregoing elements.

BRIEF DESCRIPTION OF THE DRAWINGS

[0004] Referring now to the drawings wherein like elements are numbered alike in the several Figures:

[0005] Figure 1 is a schematic cross-sectional elevational view of a fastener in a representative roof assembly with a dedicated energy absorbing material thereafter;

[0006] Figure 2 is a top plan view of the fastener and energy absorbing material; and

[0007] Figure 3 is a schematic cross-sectional elevational view of an alternate embodiment of the Figure 1 embodiment.

DETAILED DESCRIPTION

[0008] Referring to Figure 1, one of ordinary skill in the art will recognize the schematic representation of a roof assembly 10 comprising simply for purposes of illustration, insulation 12, cover board 14 and a roof waterproofing membrane 16. A fastener 18 is illustrated extending through board 14 and insulation 12. Fastener 18 includes a head 20 and is employed in one embodiment with a washer 22 to spread the hold-down load on the cover board 14. In the method disclosed herein, locating a fastener 18 is intended to encompass, at least, placing a fastener in the roof assembly or finding a fastener already in the roof structure, regardless of who put it there or when. Once fastener 18 has been located, whether or not the specific fastener employs a washer (washer embodiment is illustrated). Energy absorbing material, which as illustrated is two layers 24 and 26 but may be more or one layer if desired, is/are disposed over

fastener head 20 and washer 22. As illustrated, it is noted that layer 24 is large enough in perimetral dimension to cover only fastener head 20. Layer 26 then is dimensioned to cover layer 24 and washer 22. It will be understood that each layer 24, 26 could be large enough in perimetral dimension to cover both fastener head 20 and washer 22 if desired.

[0009] The energy absorbing material may comprise ethylene propylene diene monomer (EPDM), butyl rubber, EPDM with a butyl gum rubber bottom or other flowable material as a combination including at least one of the foregoing, and in one embodiment is affixed to fastener head 20 and washer 22 by adhering. The adhering may be by applying an adhesive material to the fastener head/washer or to the energy absorbing material during installation of the energy absorbing material, or may be simply by sticking down (self-stick) the energy absorbing material having had an adhesive pre-applied thereto.

[00010] It is to be understood that the roof structure illustrated in Figure 1 is only for purposes of illustrating an environment in which the method and system disclosed herein is employed and that other and different roof assemblies are equally benefited by the method and system described herein. In addition, although Figure 2 illustrates a rounded perimetral shape of the energy absorbing material, other shapes such as square, rectangular, triangular, oval, polygonal, etc. are acceptable substitutes providing at least the head 20 of fastener 18 is covered and in one embodiment both head 20 and washer 22 are covered.

[00011] In an alternate embodiment hereof, the energy absorbing layer(s) may be placed on top of the waterproofing membrane directly over a fastener instead of being applied directly to the fastener with similar beneficial results. This is illustrated in Figure 3 with all similar elements from Figure 1 carrying identical designations and the energy absorbing material carrying similar designations but bearing the alpha character "a" as a postscript.

[00012] While preferred embodiments have been shown and described, modifications and substitutions may be made thereto without departing from the spirit and scope of the invention. Accordingly, it is to be understood that the present invention has been described by way of illustrations and not limitation.

What is claimed is: